Preliminary Findings from an Evaluation of the Acceptability of an Expert System

Bonnie Kaplan, Ph.D.[1,3], Ralph A. Morelli, Ph.D.[2,3], John W. Goethe, M.D.[3]

[1] Department of Computer Science/Information Systems, Quinnipiac College, Hamden CT
Yale Center for Medical Informatics, Yale University, New Haven, CT
[2] Department of Engineering and Computer Science, Trinity College, Hartford, CT
[3] Institute of Living, Hartford, CT

Introduction. CEMS (Computer Evaluation and Monitoring System) is an expert system that monitors and evaluates actions recorded in a hospital information system. It checks for conformity of diagnosis with diagnostic criteria, and it also issues on-line alert messages when standard clinical practices are not followed, or when laboratory results or other data indicate the presence of abnormalities.[1]

CEMS is one of relatively few expert systems in routine use in a clinical setting. A social interactionist evaluation of CEMS has been based Kaplan's framework of control, communication, care, and context.[2,3] The primary research areas for this study are: (1) clinical acceptance of CEMS, (2) impacts on clinical practice, and (3) social and organizational context.

Methods. Open-ended interviews were conducted with clinicians, system use was observed, and two system training sessions for new psychiatry residents also were observed.

Findings. Preliminary findings suggest the following:

● The system is used routinely . However, clinicians did not feel they got much benefit from it; they receive reports on diagnosis as late as days or weeks after entering patient information.
● Some physicians regularly checked the on-line alerts the system generates. They claimed they rarely got any new information from these alerts, and they infrequently saw a need to change how a patient is being treated.
● Most users complained that the menu-based system interface is unduly complicated and difficult to use.

Discussion. These preliminary findings suggest the following issues:

● the importance of user interface for system acceptance,
● what clinicians consider to be useless system outputs,
● how and why the system is used, and
● how and why various implementation decisions were made.

Conclusions. The evaluation design for this study has helped in identifying issues both for further systems development and for better understanding issues surrounding use of computer information systems to improve clinical care. System interface design, placement of terminals, and usefulness of the system all are issues needing to be addressed to improve the system and to modify it for use in additional patient care areas. In addition, the study suggests evidence of the importance of political and organizational issues in systems acceptance. Further investigation is needed to determine for whom, and for what purposes, the system is considered useful. Clinicians' interpretations of reasons for the system and consequences of their own use of it point to a sense of difference between administrative and clinical goals, and possibly also between goals and constraints of each of these groups and those of system developers.

References

1. Bronzino JD, Morelli RA, Goethe JW. OVERSEER: an expert system monitoring drug treatment in the psychiatric clinic, IEEE Trans Biomed Eng 1989;36:533-550.
2. Anderson JG, Aydin CE, and Kaplan B. An analytical framework for measuring the effectiveness/impacts of computer-based patient record systems. Hawaii International Conference on Systems Science Procs. 1995:767-776.
3. Kaplan B. Addressing Organizational Issues into the Evaluation of Medical Systems. JAMIA 1997;4:94-101.